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ABSTRACT

This study explored the relationship between locus of control, Ss skill/chance perceptions, and verifiability of feedback on Ss decision time in a letter elimination task. Ss were 72 male and 72 female undergraduates, divided into groups of internals and externals based on results from Rotter's I-E scale. In a letter elimination task, several experimental situations were enacted to determine decision times. Results showed no difference between internals and externals with respect to decision times on the tasks when taking skill/chance perceptions or verifiability of feedback into account. It was also discovered that internals exhibited a trend toward accepting skill instructions and rejecting chance instructions. The author concludes that both internals and externals are more highly motivated on a more involved type of task when they perceive their performance as being due to skill rather than to chance. The results also point out the necessity for taking into account Ss skill/change perceptions of the task employing skill/chance instructions. (Author/PC)

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Effects of Internal-External Control, Skill/Chance Perception
and Verifiability of Feedback on Decision Time*

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Locus of control is a personality construct put forth by Rotter (1966) which refers to a person's generalized expectancy that he either possesses control over events that happen to him (internal locus of control) or that he instead views events as being under the control of fate, chance or powerful others (external locus of control).

Several researchers (Rotter and Mulry, 1965; Lefcourt, Lewis and Silverman, 1968) have reported that skill and chance tasks have different reinforcement values for internals and externals as defined by Rotter's (1966) personality construct. Using decision time as a measure of motivation on an angle-matching task, Rotter and Mulry (1965) found that internals had longer decision times when they received instructions that stated their performance was due to skill than when they received instructions that stated their performance was due to chance. Externals, however, had longer decision times under the chance instruction condition than under the skill instruction condition. Rotter and Mulry theorized that internals perceive skill tasks (where reinforcements are supposedly under their control) to have more reinforcement value than chance tasks (where reinforcements are outside of their control) and so are more highly motivated on skill tasks. Externals perceive chance tasks to have higher reinforcement value and so are more motivated on chance tasks.

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Lefcourt, Lewis and Silverman (1968) reported similar results using a level of aspiration task, however, they found it necessary to take into account Ss' perceptions of the task regarding its skill or chance determination. The predicted results were not obtained on the basis of the skill or chance instructions Ss received, but when Ss' perceptions were measured post experimentally it was found that internals had longer decision times when perceiving the task as a skill task rather than a chance task while externals had longer decision times when perceiving the task as due to chance rather than skill. Lefcourt, Lewis and Silverman (1968) found that many Ss had perceptions that did not coincide with the instructions they received. Internals, in particular, were biased toward accepting skill instructions and rejecting chance instructions.

In a more recent investigation involving children, Baron and Ganz (1972) ignored the skill/chance dimension and found that the verifiability of Ss' feedback had a significant effect on their performance. Internals performed best on a simple learning task when they received verifiable feedback while externals performed best when they received non-verifiable feedback. In line with what Lefcourt, Lewis and Silverman report, however, it would seem necessary to have measured Ss' skill/chance perceptions in the Baron and Ganz study as their results might possibly be explained on the basis of these perceptions.

The present study explored the relationship between locus of control, Ss skill/chance perceptions and verifiability of feedback on Ss' decision times in a letter elimination task.

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Procedure

It was hypothesized that internals would exhibit longer decision times on a task where they perceived their performance as due to skill rather than chance regardless of feedback verifiability. It was also hypothesized that externals would exhibit longer decision times on a task where they perceived their performance to be due to chance or luck rather than skill, also regardless of feedback verifiability. Finally it was hypothesized that internals would be biased toward accepting skill instructions and toward rejecting chance instructions (see Table 1). This bias is reported by Lefcourt, Lewis and Silverman (1968) and follows from the literature which reports internals to be less influenceable than externals.

Seventy-two male and 72 female undergraduates, enrolled in introductory psychology courses at Ohio University, were employed as Ss. All Ss participated in a group testing situation wherein they were administered Rotter's I-E scale (Rotter, 1966). Based on the mean score of the overall sample tested ($\bar{x} = 11.9$), Ss were divided into groups of internals (IE score ≤ 11) and externals (IE score > 11). The mean and standard deviation for the I-E scores in the group of 144 Ss who ultimately participated in the experiment were 11.6 and 4.4 respectively.

Ss worked on a letter elimination task which required them to uncover three squares on a 36-square letter task board. The letter "F" was sketched in red on the letter task board, taking up 7 of the 36 squares. The remaining 29 squares on the letter task board were white. All 36 squares on the

letter task board were then covered by black pieces of tape, hiding the letter "F" from the Ss view.

Ss were able to view a second board, called the letter reference board on which were sketched 25 miniature 36-square boards. Each of the miniature sketches had several of its squares colored red in the shape of a single letter of the alphabet. Ss were told that one of the 25 letters on the letter reference board was the letter under the tape on the letter task board. Ss were then instructed to choose three squares (one at a time) on the letter task board to be uncovered, with the object of choosing those squares which would best enable them to eliminate as many as possible of the 25 letters that could be on the letter task board (e.g., S might initially choose the upper-right corner square on the 36-square letter task board. S then finds out that this square is red. Referring to the letter reference board he discovers that 8 of the 25 possible letters have that corner square as red, therefore, he narrowed it down to 8 possible letters just on his first choice. S then chose two more squares for uncovering with the object of narrowing down the possibilities even further.) Ss were given either skill, chance or neutral instructions and either allowed to remove the tape over the square they chose (self-verifiable feedback condition) or were informed of the color of the square they chose by the experimenter (non-verifiable feedback condition). In addition, in the non-verifiable feedback condition the E placed a piece of colored construction paper (either red or white depending on the color of the square chosen) on top

of the tape over the square chosen so the S could keep track of the color of the three squares he/she chose. This action was unnecessary in the self-verifiable condition as Ss there could easily verify the color of the square they chose by removing the tape covering it. Ss' skill/chance perceptions of the task were measured post-experimentally on a 7 point Likert-type scale, ranging from 1 (entirely due to chance) to 7 (entirely due to skill).

Results

The primary hypotheses were rejected. Internals and externals did not differ with respect to their decision times on the present task when taking skill/chance perceptions or verifiability of feedback into account. Thus, the present results are inconsistent with the hypothesis that internals are more motivated on a skill task while externals are more motivated on a chance task. Instead, all Ss had significantly longer decision times ($p < .01$) when they perceived the task as a skill task than when they perceived it as a chance task. The mean decision time for Ss with skill perceptions was 10.8 minutes while the mean decision time for Ss with chance perceptions was 7.5 minutes. Internals had mean decision times of 10.5 mins. and 7.4 mins. for skill and chance perceptions respectively. Similarly the mean decision times for externals with skill and chance perceptions were 11.1 and 7.5 mins. respectively (see Table 2).

It should be pointed out that a significant Sex difference (males perceived the task significantly more as a skill task than females did) necessitated using the median skill/chance

perception score for each sex separately in setting up the skill-and-chance-perception groups. This caused several males who actually perceived the task to be due slightly more to skill to be included in the chance perception group, however, no significant differences resulted from this manipulation.

Table 3 reveals no significant differences in the decision times of internals and externals under conditions of self-verifiable or non-verifiable feedback, even though the slight differences exhibited are in the direction predicted by Baron and Ganz (1972).

Finally, it was discovered that internals exhibited a trend ($p < .10$) toward accepting skill instructions and rejecting chance instructions. In the skill instruction condition 21 of 24 internals (87.5%) perceived the task as a skill task while in the chance instruction condition, only 15 of 24 internals (62.5%) perceived the task as a chance task. Externals showed no difference in their tendency to "accept" skill or chance instructions (see Table 4).

Conclusions and Implications

The present results question the generality of earlier research that showed internals and externals to have differing reinforcement values for skill and chance tasks. Whereas earlier researchers employed tasks where Ss made many independent decisions that required only a few seconds apiece, the present study employed a "cumulative" task on which Ss spent several minutes making three dependent decisions. Thus it appears that both internals and externals are more highly motivated on a more involved type of task when they perceive

their performance as being due to skill rather than to chance.

The absence of findings with regard to feedback verifiability may have been due to the many differences between the present study and that of Baron and Ganz (1972). Whereas Baron and Ganz found an interaction between locus of control and feedback verifiability measuring a performance variable with elementary school children, the present research found no such interaction when employing a measure of motivation with college students. Verifiability of feedback had no effect on Ss in the present study.

The present results also point out the absolute necessity for taking into account Ss skill/chance perceptions of the task when employing skill/chance instructions. Evidence was found not only to support Lefcourt, Lewis and Silverman's finding that internals are less accepting of chance instructions than externals but also to suggest that males may possibly see certain game-type tasks as more skill-like than females do. Thus it appears that E's are not safe in assuming their skill or chance instructions will produce similar skill/chance perceptions in their Ss.

TABLE 1

Major Hypotheses Concerning the Interactions of Locus of Control and Skill/Chance Perception and Locus of Control and Skill/Chance Instructions

Locus of Control	Perception/Instructions	
	Skill	Chance
Internal	Perception: Hi decision time Instructions: Hi acceptance	Perception: Lo decision time Instructions: Lo acceptance
External	Perception: Lo decision time Instructions: Hi acceptance	Perception: Hi decision time Instructions: Hi acceptance

TABLE 2

Cell Means for the Interaction of Locus of Control and Skill/Chance Perception on Total Decision Times

Locus of Control	Perception	
	Skill	Chance
Internal	10.50 (min.)	7.43
External	11.06	7.54
Combined	10.78 _a	7.49 _a

Note: Means with subscripts are significantly different ($p < .01$).

TABLE 3

Cell Means for the Interaction of Feedback and
Locus of Control on Total Decision Times

Locus of Control	Feedback	
	Self-Verifiable	Non-Verifiable
Internal	8.67 (min.)	9.26
External	7.51	11.09

TABLE 4

Percentages of Ss Having Skill/Chance Perceptions in Agreement
with the Skill/Chance Instructions They Received

Locus of Control	Instructions	
	Skill	Chance
Internal	87.5a	62.5a
External	83.3	79.2

Note: Percentages with subscripts exhibited a trend towards a significant difference ($p < .10$).